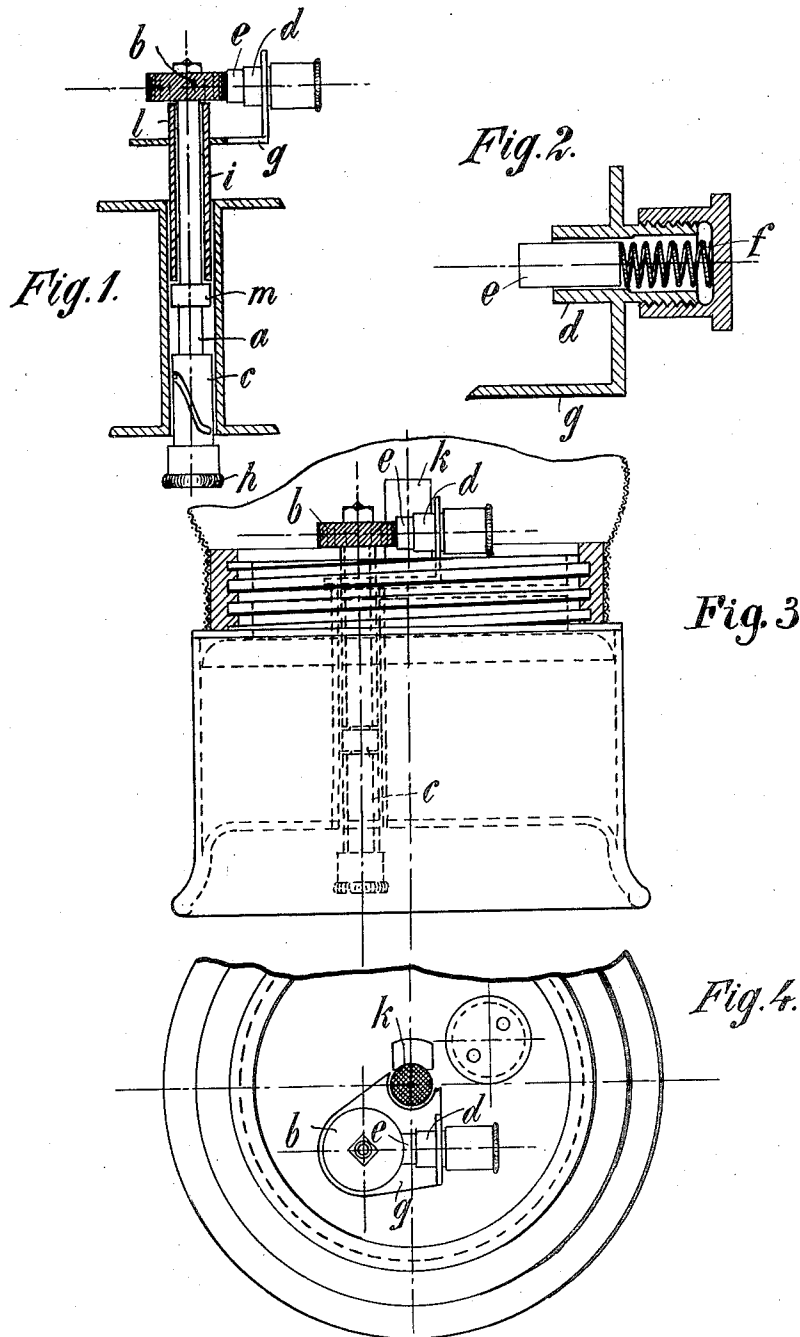


A. FILLUNGER.
LIGHTING OR IGNITING DEVICE FOR LAMPS.
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1,057,536.

Patented Apr. 1, 1913.



Witnesses:

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UNITED STATES PATENT OFFICE.

AUGUST FILLUNGER, OF MÄHRISCH, OSTRAU, AUSTRIA-HUNGARY.

LIGHTING OR IGNITING DEVICE FOR LAMPS.

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Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed March 7, 1903. Serial No. 419,654.

To all whom it may concern:

Be it known that I, AUGUST FILLUNGER, a citizen of the Empire of Austria-Hungary, residing at Mährisch, Ostrau, Austria-Hungary, have invented new and useful Improvements in Lighting or Igniting Devices for Lamps, of which the following is a specification.

My invention relates to improvements in lighting devices for lamps and especially for miners' safety lamps, *i. e.*, lamps manufactured after the design of Sir Humphrey Davy.

The purpose of the invention is to make unnecessary the complicated and unreliable devices, such as primer strips, capsules and the like, which are now in general use and to avoid the inconveniences incident to the use of those unsatisfactory devices.

The invention is based on the properties of certain solid bodies, and especially of pyrophorous metal alloys, such as the alloy of iron and cerium, to emit sparks when brought into frictional contact with a piece of steel or file. Until the applicant commenced his experiments it was deemed unlikely that the said alloy could be used for miners' safety lamps, for it would appear that the sparks would pass through the mesh of the wire chimney and ignite the fire damp in the mine. After many experiments, the applicant has found that the sparks are not dangerous after traveling about 9 mm., and therefore cannot ignite the gases of the mine even if they pass through the mesh of the wire chimney. Hitherto, white phosphorus was generally used for lighting miners' safety lamps, but this substance is so dangerous to manufacture that in the European countries its use is forbidden except for igniting strips for miners' safety lamps, no other satisfactory means being hitherto known for use in the lighting of miners' safety lamps. In the use of the igniting strips, now universally provided for lighting miners' safety lamps, it frequently happens that the igniting strip fails to operate until after four or five attempts have been made to light the lamp when the strip which has missed fire will burn causing the production of vapors which cover the lamp chimney greatly diminishing the lighting effect of the lamp. All these objections are overcome by the use of my lighting device and it is necessary to renew the members of my device only at

very long intervals while in the devices now in use the igniting strips must be replaced constantly.

Another advantage in the use of my invention is that while the lighting devices heretofore known occupy considerable space in the lower part of the miners' safety lamps, thereby limiting the oil supply my device will not encroach on the oil receptacle except for the passage of a tube $\frac{3}{4}$ of an inch in diameter.

In the drawings similar reference characters refer to similar parts in all the views in which:

Figure 1 is a side elevation of the lighting device; Fig. 2 is an enlarged sectional view of the means for pressing the pyrophorous material against the disk; Fig. 3 is a view of the lower portion of the miners' safety lamp with my lighting device applied thereto; Fig. 4 is a plan view of the arrangement of the members as shown in Fig. 3.

The lighting device consists of a spindle *a* which is arranged to slide up and down in a tube provided in the body or font *A* of the lamp. The spindle *a* is provided at its upper end with a milled disk *b* and at its lower end with a loosely fitting sleeve *c*, disposed between it and the said tube; there being a bayonet slot in the sleeve *c* with which engages a stud on the spindle *a* so that by turning the sleeve *c* the spindle *a* may be raised or lowered as desired to an operative or inoperative position. At the lower end of the sleeve *c* is secured a milled disk *h* for rotating it. Against the wheel *b* is pressed a piece of pyrophorous material *e* such as an alloy of iron and cerium with a constant pressure by means of a spring *f* disposed in a box mounted on a sheet metal bracket *g*. The pyrophorous body is guided by the guiding tube *d* in its motion. The sheet metal bracket *g* is fixed to the tube *i* which serves as a guide to the spindle *a*, the rotation of the whole lighting device being prevented by the bracket *g* which is shaped to fit the burner or wick tube *k*, which serves as an abutment. It is, however, understood that the bracket *g* is free to move upwardly and downwardly against the burner. To prevent the spindle *a* from moving upwardly or downwardly out of position with respect to the pyrophorous material *e*, the tube *i* is confined between the disk *b* and an enlargement *m* on the spin-

dle. Burner *h* is encircled by a glass chimney *o* that extends vertically beyond the same, while the chimney is surmounted by a wire gauze inclosure or dome *p*.

5 In using the device the button or finger piece *h* is drawn downwardly and is rotated clockwise so that the stud on the spindle *a* will travel to the top of the bayonet slot when by pushing upwardly on the button *h* the disk *b* and the pyrophorous material *e* will be raised to the level of the wick. When the button *h* is then rotated the disk *b* will be rotated against the pyrophorous material *e* which is pressed against the disk *b*, as has been stated, thereby emitting sparks which pass over the wick which is impregnated with inflammable material and the ignition takes place, but there is no danger of the sparks igniting the gas beyond the wire gauze screen or chimney as they are not dangerous after traveling 9 mm. After the wick has been lighted the device is withdrawn and the sleeve *c* is rotated in the opposite direction to move it into the tube. The lighting device is lowered to prevent it from casting shadows and also to prevent it from becoming heated.

What I claim as new is:

1. In a miner's safety lamp, a fuel font, a burner tube extending upwardly therefrom, in combination with an igniting device comprising a supporting member slidably mounted in the font and carrying a relatively fixed pyrophorous body and a coacting relatively movable friction member, and an exteriorly accessible finger piece for raising the supporting member to bring said pyrophorous body and friction member into substantial horizontal alinement with the upper end of the burner tube and for subsequently effecting a frictional engagement between said last named member and the pyrophorous body.

2. In a miner's safety lamp, a fuel font, a burner tube extending upwardly therefrom, in combination with an igniting device comprising a supporting member slidably mounted in the font and carrying a relatively fixed

pyrophorous body and a coacting friction member rotatable in a horizontal plane, and an exteriorly accessible finger piece for raising the supporting member to bring said pyrophorous body and friction member into substantial horizontal alinement with the upper end of the burner tube and for subsequently rotating the friction member while contacting with the pyrophorous body.

3. The combination with a lamp of co-operating members mounted on a bracket and a rotatable spindle, said spindle being disposed in a tube, said tube being integral with said bracket, said spindle adapted to position said members operatively with respect to the burner of said lamp, and when rotated to cause relative movement between said members to effect the lighting operation.

4. The combination with a lamp having an opening through the body thereof, of a tube, a bracket secured thereto, a spindle rotatably disposed in the tube, coöperating lighting members secured to the spindle and the bracket respectively, means to prevent the rotation of the bracket, means for checking relative longitudinal movement of said tube and spindle, a sleeve in which the bottom of the spindle is disposed and a bayonet joint between the spindle and the sleeve.

5. The combination with a lamp having an opening through the body thereof, of a tube, a bracket secured thereto, a spindle disposed in the tube, a metallic disk, a pyrophorous substance in contact therewith, one of the two last named elements being mounted on the spindle and the other on the bracket, means to prevent the rotation of the bracket, means to rotate and to raise and lower the spindle relatively to the body of the lamp.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

AUGUST FILLUNGER.

Witnesses:

ROBERT W. HEINGARTNER,
AUGUST FUGGER.